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Applicant: ProAc ApS
(Name and address) Vildrosevej 3
DK-3500 Værløse
Denmark

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Bo Z. Tidemann



PATENT- OG VAREMÆRKESTYRELSEN

A LOCK FOR A SAFETY BOX, A CHAIR PROVIDED WITH A SAFETY BOX AND A FASTENING ANCHOR FOR SECURING A BEACH SAFETY BOX OR OTHER OBJECTS

Introduction

The invention provides a box, termed a beach-safety-box, for safe and convenient storage of personal valuables on beaches and other public or semi-public places. Furthermore, the invention provides a device, termed a safety-anchor, which in a first aspect easily can be installed into the ground but which is very difficult to remove for anyone but the authorised user and consequently can serve as an anchor point for the beach-safety-box. In a second aspect, the safety anchor serve as a, in principle ordinary, screw or bolt which can be inserted into an object as a fastening means, but which is very difficult to remove afterwards.

Background

People typically carry an assortment of valuables such as cash, credit cards, cellular phones, watches, electronic devices, etc., i.e. valuables which are attractive for thieves. Although such valuables can be stolen even when located on the owner e.g. in the owners pocket, the risk of theft increases with the distance between the valuables and the owner, e.g. when the valuables are placed in a handbag, put into an unlocked drawer, left in overcoats, etc. In particular, there is a risk of theft when such separation occurs in public or semi-public places such as restaurants, offices, etc. A particular problematic place to secure valuables for owners is a crowded beach in the summer season as such valuables are either impractical or impossible to carry or difficult to constantly monitor when performing most beach activities such as sun-tanning, bathing, playing games, etc.

Obviously, individuals/companies that provide services to beach guests such as renting sun-beds, sun-parasols, etc. ("renters") could address the problem of safe-storage on beaches by traditional approaches such as providing a centrally located safe-storage facility similar to that found in railway stations, etc. This solution, however, is not practical on beaches because valuables such as a CD, a Walkman, a cellular phone, sun-glasses, cash, etc. which the owner chooses to bring to the beach must be readily and repetitively available throughout the day to fulfil their objective. On beaches therefore, useful safe storage must be provided at, or close to, the site where the owner chooses to lie (on-site storage).

In theory, such on-site storage could be provided by distributing traditional iron safes, like the ones commonly found in hotel rooms, throughout the beach. Obviously, however, a number of factors makes this solution both highly impractical and commercially unsound such as for instance the cost of such safes, the considerable difficulties in distributing and collecting them at sun-up and sun-set (on those beaches where permanent fixation of large numbers of safes would either not be allowed or desirable) and the general design and choice of materials of said safes not being optimised for use in a beach environment.

In fact, as described in the following section safe-storage on beaches presents a range of special problems for both the beach guest (user), manufacturer and renter that traditional approaches do not address – a fact which is forcefully underlined by the lack of safe-storage means on most beaches.

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The design of a useful device for safe-storage of valuables on beaches poses a number of special problems, some of which are seemingly opposing. For instance, the safe-storage device,

- 10 1. should be easy to place/provide close to, or preferentially at, the site where the user chooses to lie yet be very difficult to remove for un-authorised persons without being noticed by the user or other people on the beach and preferably be very awkward to escape with if chased.
- 15 2. should be difficult to break into by un-authorised persons whilst at the same time enable moderately easy "authorised break-in" in cases where the user has lost the means to open the beach-safety-box the intended way.
- 20 3. should be cheap to manufacture yet have a reasonable lifetime under the conditions to which it is exposed.

Furthermore, as beach-safety-boxes, in many cases, are likely to become subjects of a beach rental operation alongside sun-beds and sun-parasols, they must be logistically simple to operate in large numbers for a renter.

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Devices that can be anchored into - and removed from - the ground by a rotating movement similar to the safety-anchor described herein and used as an attachment point for a variety of different devices such as beach-umbrellas, beach-watercrafts, flags, pets, fishing rods etc. are known such as for instance the eartwormTM

- 30 (www.theearthworm.com) and the beach-anchor (www.beachstuf.com). None of these devices, however, includes a gear-box which enables easy removal by authorised individuals but prevent such action by unauthorised persons without substantial and lengthy efforts. As such, they are not useful as attachments points for valuable items that are attractive objects for thieves.

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Description of the invention

- 40 It is an object of the present invention to provide means allowing for safe storage of valuables, e.g. on a beach and allowing safe rental of storage devices. Accordingly, a first aspect of the present invention relates to a combination lock for a safety box, said lock comprising

- a lock effectuating means adapted to shift between a locked state and an unlocked state,
- a code-entering means arranged to control shifting of the lock effectuating means from the locked state to the unlocked state upon entering a code, and
- a lock actuation means adapted to actuate the code-entering means to accept and store a user-defined code upon receipt of a lock actuator,

wherein the ability of the lock to shift between the locked and unlocked state is conditioned on the actuation of the lock.

Due to the fact that the ability of the lock to shift between the locked and the unlocked state is conditioned on the actuation, the lock supports rental services. As an example, in a situation wherein a large number of locks, e.g. associated with beach chairs with safety boxes, are rented on an hourly or daily basis. Upon payment of a rental fee to a beach guard, the user is provided with lock actuator which is used to actuate one of the locks on the beach.

The lock effectuating means may be provided e.g. in the form of a locking element, ring, clamp bolt or similar mechanical device adapted to engage a corresponding recess or edge of a closure or frame therefore or which is adapted to operate in a padlock fashion.

The code-entering means may be provided in the form of a digital keyboard, one or more dials etc. and may comprise control means adapted, upon setting of the right code, to shift the lock from the locked state to the unlocked state.

In order to ensure that a lock can be opened in cases where the user has forgotten the code, it is an advantage to allow multiple entering of codes. In the case the user forgets the code, it may take e.g. 50-1000 trials to open the lock. A sample space of this size will ensure that it is not too easy and yet not too troublesome to try out all combinations. Depending on the type of code-entering means, it should be possible to open a lock within 10-30 minutes. A person skilled-in-the-art will appreciate that such a functionality can be provided by for instance the 3 or 4-digit mechanical code locks found on many suitcases, 3 or 4-digit code padlock or 3 or 4-digit electronic code-locks.

It is important to realise that thieves on beaches typically operate by a walk-by-and-grab approach at a point in time when the owner is inattentive. As such, a special feature of a useful lock for a beach-safety-box, that sets it apart from locks on many other safe-storage devices, is that it need not protect against break-in attempts for prolonged periods of time such as hours or days. In fact, a lock on a beach-safety-box that offers as little as for instance 5 min. resistance to break-in is highly functional when, at the same time, the beach-safety-box is very difficult to remove without attracting attention from either the user or other people on the beach.

The design of a beach safe-storage device must take into account that a number of users may forget their password and as such be faced with the problem of how to retrieve his/hers valuables. Since the beach-safety-box, for the security reasons outlined above, must only be operable with the proper code, the only option when the user forgets his/hers code is to systematically test all the possible codes that the lock can accommodate. Thus, in contrast to the sophisticated code locks used in traditional safes, a code lock on a beach-safety-box should be of low complexity to allow the user/renter to test the entire universe of possible codes within a reasonable time frame and it should, therefore, also not contain any sophisticated "anti-tampering" features or activate an alarm in the process.

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A useful lock for a beach safety-box is further set apart from those in traditional safes by the fact that it also needs to facilitate "authorised break-in" within a reasonable timeframe, to address the potential problem of its user becoming unable to open the beach-safety-box the intended way. A suitable lock mechanisms for a beach-safety-box, therefore, must satisfy the dual criteria that it should provide enough, but not too much, protection against break-in attempts.

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In order to allow different users to subsequently use a lock, the lock should enable that the user redefines the code. This may be achieved e.g. by adapting the lock to accept a new code upon insertion of the actuator.

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In order to ensure that no safety boxes are left in a locked state, the lock may be adapted to shift from the locked state to its unlocked state upon removal of the actuator. The actuators may as an example be rented to the beach guests upon payment of a deposit which is paid back to the guest upon return of the actuator. At the end of the day, the possession of all available actuators proves to the responsible person, that no safety boxes are left in a locked state.

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The lock is preferably purely mechanical, i.e. it operates without power supply. However, it may be an advantage to provide an electrically powered lock wherein the user-defined code is maintained irrespective of power failure and re-powering.

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A simple and yet reliable actuation of the lock may be provided by actuation means defining a key-hole for receiving a key with a specific exterior shape. The lock may be provided with a shape template which is interchangeable and which thus allows the owner of the lock to change the shape of the actuator frequently and thus to ensure liability of the lock. In order to allow maintenance of a plurality of locks, all locks may be provided with the same shape template and thus be adapted to activate with actuators of the same shape. It should be noted that the safety towards theft is ensured by the user defined code and therefore nothing hinders the use of actuators of the same shape.

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According to an alternative embodiment, the actuation means and the actuators may co-operate to actuate the lock based on a specific weight of the actuator.

In order to provide a lock which is durable e.g. on a beach, it is an advantage to provide the lock in non-corrosive materials such as plastic.

In theory, there are several different locks that can be used on a beach-safety-box. For instance, the beach-safety-box may be equipped with a traditional lock that can be operated by a dedicated instrument, such as for instance a key. Such a solution, however, suffers from a number of shortcomings that makes it unattractive. For instance, anyone who intended to make beach-safety-boxes the subject of a rental business similar to the renting of sun-beds would find a solution based on a dedicated key for each beach-safety-box logistically very complex to manage.

Furthermore, keys are impractical to carry on the beach for the user and may also be lost. As a lost key may be found by others and as such compromise safety, an owner that wishes to maintain maximal security of his/hers beach-safety-box cannot simply replace a lost key with a spare key but must re-code the lock and make a new key. To a renter who needs to be particular concerned about the security of the beach-safety-boxes that he rents to users, a lost key therefore invokes both expenses, potential loss of income and inconvenience.

To a renter, a key based solution would further require the holding of either dedicated spare keys, or a master key that opens all beach-safety-boxes to allow users that have accidentally lost their key access to their valuables within a reasonable timeframe. The mere existence of such spare keys or master keys, however, would be severely worrying to the user as optimal safety requires that only he/she has the means to readily open his/hers beach-safety-box ("user exclusive access").

Such "user exclusive" access can be achieved by providing the beach-safety-box with an electronic or mechanical code lock, which enables the user to operate the beach-safety-box with a password of his/hers own choosing. To the user, this solution affords the security offered by a personal password known only to the user as well as the convenience of not having to carry any physical objects to operate the beach-safety-box. Likewise, such a solution is practical to the renter as it would dispense with many of the above outlined problems associated with a key based solution.

Electronic or mechanical code locks are known from for instance safes in hotel rooms, offices and private homes. Since such safes are often left unattended for prolonged period of times such as hours, days or more their code locks must be sufficiently sophisticated to operate with complex codes that can withstand very lengthy code-breaking attempts or they must be fitted with "anti-tampering" features that for instance shuts down the lock, or activates a theft-alarm, if three or more erroneous codes are entered.

Whilst such sophisticated locks are necessary with traditional safes they are neither needed nor desired in a beach-safety-box. Firstly, as mentioned before, beach-safety-

boxes need not protect against break-in attempts for prolonged periods of time. As such, they can use much simpler and therefore far less expensive code locks.

It is anticipated that the beach-safety-box in many cases will become the subject of a rental business alongside sun-beds and sun-parasols. A particular objective of the invention, therefore, is to construct the beach-safety-box in such a way that the user is encouraged to leave the beach-safety-box in a condition where it is readily usable for a subsequent user. In other words, the design of the beach-safety-box should be such that the user is encouraged not to leave the beach-safety-box closed and with his/hers personal code still active at the end of the use period.

One means of achieving this is by making the function of the code-lock dependent on an instrument, which can be entrusted to the user by the renter against a deposit that strongly motivates the user to return the instrument to the renter at the end of the use period. This can be achieved by for instance designing the code-lock in such a way that it

- requires for instance a pin, to be inserted into a position in the lock mechanisms which is accessible only when the beach-safety-box is open
- "activates" the lock to accept a user defined code upon insertion of the pin, and
- disables the code upon removal of the pin.

As mentioned above, for security reasons, it is an advantage that the insertion point for the pin into the lock is only accessible when the beach-safety-box is open, i.e. when the beach-safety-box is available for use. This being the case, the pin can be made universal, i.e. one pin fits all beach-safety-boxes, which is a major advantage to the logistics of handling multiple beach-safety-devices for the renter.

Activating pins, however, as all other items may be lost by the user and found by others or stolen. Although pins in unauthorised possession do not present any risk to the user of a beach-safety-box as pins require access to the interior of the beach-safety-box to work, it does, however, present a potential loss of income to the renter as holders of such unauthorised pins can operate an unoccupied beach-safety-box without paying. Although, this is unlikely to become a problem in the short term for the individual renter – it may become troublesome in the long run as more pins are likely to get into unauthorised hands.

In a preferred embodiment of the beach-safety-box, therefore, the code-lock is designed in such a way that it can be set by the renter to accept a number of different pins, such as for instance from 2 to 10 different pins, by a simple manual operation thus allowing the renter to "cleanse" his beach-safety-box renting business by simply acquiring new pins.

In many cases, the renter is likely to charge the user a fee for using the beach-safety-box. In such cases the renter can for instance deduct a rental fee from the deposit the user paid to initially obtain the pin when the user returns the instrument. In other cases, however, the owner may choose to provide the beach-safety-box for free, such as for instance in
 5 hotels where sun-beds, sun-parasols, etc. are often provided to the guests free-of-charge. In such cases, a pin system to activate the code-lock is not optimal as the incentive to return the pin to the owner rests on the payment of an "encouraging" deposit. In a preferred embodiment of the invention, therefore, a code-lock is provided that in place of, and with the same functionality as a pin, is operable with a coin of enough value that the
 10 customer will want to retrieve it after end use.

In one preferred embodiment of the invention the code lock, which can be either a mechanical or electronic code lock, is built into the beach-safety-box and is activated/deactivated by the insertion/removal of for instance a pin or a coin.
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In another preferred embodiment the code-lock is provided as a separate item, such as for instance a code padlock. Such a design has the advantage that the beach-safety-box will be cheaper to manufacture than a beach-safety-box with an integrated code lock. Padlocks, however, are easily destroyed by cutting-tools and as such do not provide the
 20 same level of security against unauthorised break-in, *per se*, as a code lock that is built into the beach-safety-box.

In a preferred embodiment of the invention, therefore, the beach-safety-box is designed in such a way that the vulnerable parts of a code padlock is physically shielded against access
 25 by cutting- tools. As shown in figure 5, this can be achieved, by for instance designing the beach-safety-box in such a way that the "vulnerable" part of the padlock is embedded in a groove or protected by a protrusion on the beach-safety-box into which an effective cutting-tools cannot get access.

Although the beach-safety-box has been described in the foregoing as a useful device on beaches it will be obvious to the reader that it can be used in a variety of situations where there is a need to secure small personal valuables against walk-by-theft such as for instance on camping-grounds or places where many people are assembled to attend for instance concerts or games.
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According to a second aspect, the present invention relates to a beach chair comprising a safety box with a closeable cavity for storage of personal items. Preferably, the box is provided with locking means preventing opening of the box and preferably, locking means in the form of a combination lock as described above.
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In order to protect the combination lock from sand and water, the code-entering part of the code-lock may be protected by a cover which automatically falls down over the code-entering part of the code lock if not actively lifted.

- In order to provide a simple and yet reliable system, the box may be provided with co-operating eyes or loops of a closing lid and the box for closing the lid with a combination padlock. However, according to a preferred embodiment, the combination lock is an integrated part of the chair and/or the box. Preferably, the actuator of the combination
- 5 lock is inserted into and removed from the box from the inside of the box. In that way, no one but the user who knows the code has direct access to the actuator. According to one preferred embodiment, the actuator is inserted into the lock from outside the cavity and can only be removed from the lock from the inside of the cavity. In that way, all boxes on the beach may be left by the owner in a locked state. When a user rents an actuator, the
- 10 actuator may be inserted into the lock of a box which is locked. After insertion of the actuator, the user is able to define his own code and to open the box. After use, the user removes the actuator whereby the lock changes to a locked state and when leaving the chair, the lid of the box falls back onto the box and a latch of the lock locks the lid.
- 15 In order to protect the valuables placed in the safety box from moist and dirt, the safety box may be provided with one or more ventilation openings for ventilation of the cavity. In a simple manner, the ventilation openings may be provided between the sidewall and the closure, e.g. by providing an upper part of the sidewall with an uneven edge so that the closure is prevented from sealing air-tightly against the sidewall. The ventilation
- 20 opening(s) may be shielded towards impact of weather in particular towards impact of rain and sand.

- In the bottom of the box, one or more drain openings for draining the cavity may be provided. In order to support valuables contained in the box on a dry surface, a grid for
- 25 retaining the personal items in the box in a position between the opening and the grid may be provided.

- In order to lead fluids to the drain opening(s) and thus to support in keeping the cavity of the box dry, the box may be provided with a bottom part which slopes downwards towards
- 30 the drain opening.

In a preferred embodiment of the invention (see figures 5 and 6), therefore, the beach-safety-box is a simple device, which can be locked by the use of a code padlock, consisting of

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- a box (with holes to facilitate appropriate mounting on a sun-bed or a safety-anchor) and a lid, produced in either cheap plastic materials suited for beach conditions, such as those used for sun-beds, or thin metal plates which can be protected against the wet and salty conditions on a beach by a suitable protective layer such as for instance a paint,
 - 40 • a metal or plastic hinge-pin that serves to connect the lid (which carries half the hinge) to the box (which carries the other half of the hinge) in such a way that the box can be opened, and

- a mount for securely attaching the beach-safety-box physically to either a sun-bed or a safety-anchor in such a way that the beach-safety box is functional and easily operable by the user.

5 Many of the valuables that the beach-safety-box is intended to store, such as electronics and mobile phones, can suffer damage if exposed to water and sand. As such, it is a further objective of the invention that the beach-safety-box is designed such that water and sand do not readily enter the interior, and/or are readily removed if they do. As shown in figures 5 and 6, this can be achieved by for instance designing the beach-safety-box in
 10 such a way that the lid significantly overhangs the box and such that the bottom of the box is slightly skewed downwards towards the centre where for instance one or more holes, slits, etc. of a suitable size provide an outlet for sand or water that has accidentally entered the interior. To provide a flat bottom on which the user can place his/hers valuables in such a skewed-bottom box a suitable horizontal grid, that will allow water and
 15 sand to pass through, can be placed above the bottom of the beach-safety-box.

In another preferred embodiment of the invention the beach box is manufactured with an integrated code lock. In this situation it is of particular importance that the code-lock itself be protected from the abrasive action of water, moist, salt and sand.

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When a mechanical code lock, that involves moving parts, is used in the beach-safety-box such protection can be provided by using for instance non-corroding materials such as plastics or aluminum and/or by protecting the code-lock with for instance a cover-lid. Preferably, as shown in figure 7 this lid is constructed in such a way that it automatically
 25 falls down and protects the code-lock if not actively lifted by the user. Preferably, also, the code lock is placed on the side of the beach-safety-box rather than on the top to secure as little as possible exposure to water, moist, salt and sand.

When an electronic code lock is used in the beach-safety-box a continuous input of electric
 30 power, such as that provided by a battery, is needed to keep the code lock functional. Since, the proper function of both the power supply and the electronics in the code lock is sensitive to moist and water it is an aspect of the invention to use appropriately protected components, such as water and moist resistant connections between the battery and the electronic circuit and a water-resistant keyboard for the code-lock. A person skilled-in-the-
 35 art will appreciate that several means exist by which such water and moist protection can be achieved.

It is a further aspect of the invention to design the beach-safety-box in such a way that the build-up of moist and/or water that may damage a mechanical code-lock, a power
 40 supply, the electronics in an electronic code lock or the users valuables is minimised. Build-up of water, of course, can be prevented by providing a water outlet in the bottom of the beach-safety-box, as described in the foregoing. Build-up of moist on the other hand, requires proper aeration of the interior of the box. Such aeration can be achieved by providing the beach-safety-box with air-inlets in the walls and/or the lid that in

combination with the water draining out-lets in the bottom enables the air to circulate through the interior. Since undesired sand may also enter through such air-inlets it is a particular aspect of the invention to provide a design that facilitates aeration whilst minimising the risk of entry of sand. As shown in figures 5-7, this can be achieved by for instance combining an oversize lid with air-inlets at the lid-box interface.

The power supply for an electronic code lock, of course, may be exhausted so that the code lock ceases to operate, i.e. cannot be opened by the user or anybody else. Whilst the probability of such incidences may be reduced by equipping the code-lock with an alarm to indicate low battery it obviously cannot be completely eliminated. To enable the authorised opening of the beach-safety-box in such cases, whilst at the same time maintain safety for the user, it is a special objective of the invention that i) the code lock remembers the active user password even after power failure and that ii) the design of the beach-safety-box enables the code lock to be re-powered by an external power supply. Such a re-powering capability can be provided by for instance inserting a power docking device, that can be accessed by an external power supply, between the internal power supply and the electronic circuits. A person skilled-in-the-art, however, will appreciate that the intended functionality can be obtained with other designs as well, which thus falls within the spirit of the inventions.

The beach-safety-box is intended to be physically attached to a safety-anchor, a sun-bed or other hard-to-move objects. Such attachment, of course, can be achieved by for instance mounting it directly to the hard-to-move object or by linking it to the hard-to-move object through a metal chain that cannot be easily cut. Since, various openings to provide outlet of water and sand and inlet of air is desirable in a beach-safety-box (as described above) and since the proper function of these features requires that the beach-safety-box is appropriately orientated in space, the preferred attachment mode for a beach safety-box is by direct mount to the hard-to-move object and in such a way that it is elevated above the beach to prevent entry of water and sand and such that it can be easily operated by the user. The beach-safety-box shown in figures 5-7 is designed such that it can be easily mounted on the safety-anchor depicted in figure 1-4 or be physically attached through a separate mount to a beach chair (figure 6). A person skilled-in-the-art, however, will recognise that other types of mounts or other designs of the beach-safety-box are possible without deviating from the spirit of the invention.

According to a third aspect, the invention relates to a safety box similar to the box described above with relation to the beach chair. The box comprises fastening means provided with a fastened and a non-fastened state for releasable fastening of the box to peripheral objects such as a beach chair or to an anchoring device for fastening items to a beach.

In order to ensure that the box can not be removed by anyone but the user, the fastening means should be provided with a fastening and releasing control which is accessible only from the inside of the cavity. As an example, the fastening means may comprise a spring activated locking element engaging a corresponding locking member of a beach chair or a

safety anchor or similar items which are less easily removed from the beach. The spring activated locking element should be releasable from inside the cavity of the box so that the box can not be removed until it has been opened.

- 5 In order to ensure that the ventilation opening and draining opening of the box is turned upwardly and downwardly, respectively, the fastening means may be adapted to only allow fastening of the box to the beach chair in one specific orientation of the box in relation to the beach chair, safety anchor or any similar obstacle. However, in order to ensure easy and fast mounting of the box to the obstacle in question, the fastening means may also be
10 adapted to allow fastening of the box to the obstacle in any orientation of the box in relation to the obstacle.

- As outlined above, it is a part of the invention to protect the beach-safety-box against unnoticed removal by unauthorised persons by physically linking it to a hard-to-move
15 object such as a sun-bed or a safety-anchor. In another embodiment of the invention the beach-safety-box is further protected against such unnoticed removal by equipping it with a theft-alarm. Such a functionality can be provided by fitting the beach-safety-box with for instance an electronic theft-alarm that sounds-out if the beach-safety-box is substantially shaken or if its orientation in 3-dimensional space is altered. To facilitate the authorised
20 removal of the beach-safety-box, such as the collection at sun-set, the activity of the theft-alarm is controlled by an on/off switch which is accessible when, and only when, the beach-safety-box is open.

- It is a further object of the invention to provide a device, termed a safety-anchor, which is
25 easy to install/uninstall for the user but very difficult to remove for un-authorized person without attracting significant attention, thereby facilitating its use as a hard-to-move attachment point for a beach-safety-box. According to a fourth aspect, the present invention relates to such a safety anchor. The safety anchor is to be secured by screwing. Briefly, the safety-anchor consists of a threaded tip and a multifunctional rod,
30 which is connected through a gear-box which in one position transmits both clockwise and counter clockwise rotating movements of the multifunctional rod into the threaded tip and in another position decouples this transmission. In the transmitting position the user can thus easily screw the safety-anchor firmly into the ground as well as remove it by rotating the multifunctional rod (using a loose installation-bar) whereas none of these operations
35 are possible in the decoupled mode. Thus, once the safety-anchor has been firmly anchored into the ground it can be protected significantly against un-authorized removal by i) shifting the gear-box to the decoupled position using the gear handle which is located at the end of the multifunctional rod which is above ground and ii) locking the gear handle in such a way that it cannot be operated by an unauthorised person. As shown in figure 4,
40 such locking of the gear handle to prevent unauthorised removal of the safety-anchor can be achieved by for instance mounting a beach-safety-box or by using a padlock.

To provide maximum protection against unauthorised removal of the safety-anchor, it is a particular aspect of the invention that the gear-box is located close to its tip thus requiring

unauthorised persons to dig deep into the ground to reach a position on the safety-anchor from which the threaded tip (that anchors the safety-anchor into the ground) can be unscrewed.

- 5 As an example, the safety anchor may be fastened into the ground or into a wall - in a manner similar to fastening of a regular bolt or screw into a wall. The rod part may preferably be provided with screw support means supporting the rotational insertion of the anchor, e.g. provided with a transverse handle member or a slot like in a slotted screw. The screw support means may e.g. be provided in a distal end of the rod, i.e. opposite the
- 10 end which is attached to the threaded part. The anchor is thus useful for securing various objects. These include, but are not limited to, devices and items such as beach-umbrellas, game poles, bags, water-crafts, bicycles, motor cycles, fishing rods, guns and other weapons used in the field, tools and machinery used outdoor in workplaces, products on display at shows and outside shops, sculptures and pottery located in gardens, an animal,
- 15 a lawnmower, or even for securing a car. Many of these objects are attractive objects to steal for thieves. In a preferred embodiment of the invention, therefore, a safety-anchor is provided with attachment means for securing peripheral objects to the anchor, e.g. eyelets, hooks or other types of mounts useful for holding and/or securing one or more of such other devices and items. A person skilled-in-the-art will appreciate that a variety of
- 20 different designs of the multifunctional rod can provide such functionalities which thus fall within the spirit of the inventions. The length of the rod may be anything between a few centimetres and several meters depending upon the material into which the anchor is inserted. If the anchor is inserted into a concrete wall of a building, the anchor may not necessarily be inserted more than a few cm. If the anchor is to be inserted into soil or
- 25 sand, the length may very likely be several meters thereby making it very difficult for anyone to remove the anchor without having to remove very large amounts of sand or soil. Likewise, the radial length of the threads may be adapted to a specific need. Again, in a concrete wall, the radial size does not have to be more than 0.5-2 cm whereas an anchor adapted for soil or sand may be provided with threads having a radial size of up to 0.25-
- 30 0.5 meters.

The rod and the tip may be divided into two pieces which are interconnected via an axial bearing so that the rod and the tip is allowed to rotate independently. Prior to the insertion of the anchor, the rotational joint is locked so that rotation of the rod is transferred to the

35 threaded part. The locking may be performed by the insertion of a locking element into a rotationally locking engagement in the rod and in the threaded tip. The locking element thus function as a "groove and tongue" like coupling between the threaded tip and the rod.

Preferably, the rod is provided in the form of a hollow tube which houses the locking

40 element and allows the element to move between a first position and a second position. In the first position, the element is disengaged with the treaded tip and in the second position, the locking element is in rotationally locking engagement with the treaded tip. When the element is allowed to move slidingly from the first to the second position or vice

versa, the user is able to shift the anchor between a locked and an unlocked state for securing the anchor or for removing the anchor, respectively.

The anchor may further comprise a handle member arranged to control the moving of the locking element from the distal end of the rod, i.e. opposite the end where the rod is attached to the threaded tip. The handle member may advantageously be adapted to co-operate with fixating means allowing fixation of the locking element in any of the first and/or the second positions. The anchor may further comprise locking means adapted to receive a pad-lock for locking the locking element in one or either the first and the second positions.

In a particular aspect of the invention the two piece safety anchor serves as the basic unit onto which other units can be mounted. For instance, the rod of the safety anchor may carry a universal mount that allows a range of other units (that provide a range of different functionalities) to be readily attached - and locked to the safety anchor.

In a special embodiment of the invention, the principle of the safety anchor is implemented into the type of screws or bolts used a normal fastening means, e.g. for fastening objects to walls. The safety anchors may therefore be provided with standard gripping means such as standard bolt- or screw heads. Such gripping means could be the normal hexagonal blot heads for spanners and monkey wrenches, but also countersunk screw heads for Allen keys, ordinary screw drivers, Parker's screw drivers etc.

Normally, screws used for security fastening purposes are 1-piece screws wherein the screw-slot (for inserting the screwdriver) allows only clockwise rotation thus enabling the screw to be fastened but not unfastened. Obviously, this uni-directional character of the screw-slot has the significant disadvantage that any problems that arise during the fastening of the screw cannot be easily corrected i.e. by simply reversing the rotation of the screwdriver.

In one embodiment of the invention the safety screw - once correctly fastened - is secured against unscrewing by driving the locking element deeper into the screw (by slightly punching at its end) which i) acts to disconnect the rotational lock between the treaded tip and the rod and ii) acts to prevent the insertion of another element that could re-establish the rotational lock.

It is an advantage to provide an anchor being adapted to reversibly shift between the locked and the unlocked state so that the user may remove the anchor in its entity if it, for example, is misplaced. In another embodiment of the invention the safety screw is therefore designed such that the rotational coupling between the two parts is uncoupled by removal of the locking element. Holders of a correct locking element can thus always unfasten the safety screw by re-insertion of the locking element whereas persons that do not have a correct locking element cannot. To increase the security of this embodiment the locking element can be provided in a large number of different designs. In a preferred

embodiment, the rod carries a code-lock which, upon entry of a code, enables shifting between the rotational coupled/decoupled mode of the two screw parts (see figure 9). In another embodiment the shift between the coupled/decoupled mode is controlled by a key which fits into a lock which is an integral part of the safety screw.

- 5 In yet another embodiment of the invention the safety screw is so designed that the locking element that serves to rotationally connect the two parts of the screw breaks when a pre-defined torque is applied to the screw thereby converting the screw to a safety screw (figure 10). By using different materials and sizes of locking elements, screws may be
- 10 manufactured that converts into safety screws at a wide range of specifically applied forces. The size of the force that is required to break the locking element can be displayed on the screw in a number of ways such as for instance a number that designates the required torque or a colour code. In a special design, the safety anchor and the locking element may be supplied separately. In this case the rotational joint is locked by insertion
- 15 of the locking element into a slot, such that the rod and the threaded part are rotationally locked together as long as the locking element is intact. The element breaks at a pre-specified torque, after which the threaded part and the rod rotate freely with respect to each other. Such a locking element could be a pin made of plastic, polymer or a soft metal such as copper or lead, in which case the breaking would start with a deformation and
- 20 therefore a slow break. The pin could also be made of a ceramic or a thin hard metal, in which case the breaking would be sudden. By choosing the thickness and the nature of the material used the exact shear force and thereby torque at which the pin breaks can be specified.
- 25 Obviously, the above principle of a two-piece screw that behaves as a normal screw until converted into a safety screw by dislocating, removing or breaking a element that rotationally connects the two pieces, or by the use of a key or code-key that determines the rotational status (connected/unconnected) of the two screw parts, can also be applied to bolts, etc. Furthermore, the principle applies equally well to very small screws and bolts
- 30 as well as very large ones.

Detailed description of the invention

- 35 In the following, the invention will be described in further details with reference to the drawing in which

Fig. 1 shows an embodiment of a safety anchor according to the fourth aspect of the present invention,

40

Fig. 2 shows details of the safety anchor shown in Fig. 1,

Fig. 3 shows details of the top part of the safety-anchor,

Fig. 4 shows a top view of safety-anchor with attached beach-safety-box according to the third aspect of the invention,

- 5 Fig. 5 shows a front and a side view of a possible design of a beach-safety-box,

Fig. 6A and B shows a back view of the beach-safety-box of figure 5, as well as the beach-safety-box mounted to a sun chair.

- 10 Fig. 7 shows a front and a side view of a possible design of a beach-safety-box with an integrated mechanical code lock according to the first aspect of the present invention.

Fig. 8, 9 and 10 show side view of possible designs of a two-piece safety-anchor.

- 15 As shown in Fig. 1, a multifunctional safety-anchor suitable for attaching a beach-safety-box, a sun-parasol etc. may comprise a threaded tip **1** adapted to drive the safety-anchor into the ground and thus for fastening the safety anchor to the ground, a gear-box **2**, a multifunctional rod **3**, a gear-pin **4**, a stop plate **5** to indicate when the safety-anchor has reached its correct depth and to stabilise the safety-anchor in a vertical position, a hole **6**
 20 to accommodate the rod of a sun-parasol (works in combination with the eyelet designated **8**), a loose installation-bar **7** to enable a user to drive the safety-anchor into the ground, an eyelet **8** to accommodate the rod of a sun-parasol, a storage cavity **9** for the installation-bar, a screw cap **10**, mounts **11** for a beach-safety-box, handle **12** for changing gear and an eyelet **13** for attaching bags, pets, etc to the safety anchor.

25

Fig. 2 shows details of the safety-anchor gear-box comprising the threaded tip **1**, the multifunctional rod **3**, the gear-pin **4** carrying a square tip **14**, juxtaposed square holes **15** in the multifunctional rod **3** and threaded tip **1** to enable the square tip **14** of the gear-pin to interlock the two halves of the safety-anchor and a waste chamber **16** adapted to
 30 prevent small amounts of sand that accidentally gets into safety-anchor from blocking the action of the gear-pin **4**. In Fig. 2a the gear-pin is in a "high" position – rotation of multifunctional rod does not transmit to the threaded tip. In Fig. 2b the gear-pin is in a "low" position – rotation of multifunctional rod does transmit to the threaded tip.

- 35 Fig.3 shows details of the top part of the safety-anchor comprising gear-pin **4**, handle **12** for changing gear, hole **17** in gear handle which, in combination with the upper hole in the beach-safety-box mount, can be used to secure the gear-handle in the non-transmitting mode using a padlock (for securing the safety-anchor against unauthorised removal in cases where the beach-safety-box is not mounted, see figure 4), mounts **11** for beach-
 40 safety-box, storage hole **9** for installation-bar and screw cap **10**.

Fig.4 shows top view of safety-anchor with attached beach-safety-box. Beach-safety-box **21**, multifunctional rod **3** of safety-anchor, juxtaposed square holes **15** in multifunctional rod and threaded tip to enable the square tip of the gear-pin to interlock the two halves of

the safety-anchor, Gear-pin **4**, handle **12** for changing gear, mounts **11** for beach-safety-box, bolts **18** to fasten beach-safety-box, grooves **19** to accommodate mounts and groove **20** to immobilise handle for changing gear in the high position (decoupled position).

- 5 Fig. 5 shows front and side view of a possible design of a beach-safety-box to be used with a code padlock. Chamber part **25** of depressed eyelet for locking by a padlock, lid part **26** of depressed eyelet for locking by a padlock, lid overhang **27**, hinges **28** that serves to connect the lid and chamber by insertion of a pin, groove **19** to accommodate mount, horizontal grid **22** that allows water and sand to pass through, slit **23** that drains water
 10 and sand that has accidentally entered the beach-safety-box and air in-lets **24** protected by the overhanging lid.

- Fig. 6A, a possible attachment of the safety box to a sun chair is shown. In B, a back view of the beach-safety-box of figure 5 and a possible design of a mount useful for attaching
 15 the beach-safety-box to a sun-bed is shown. Hinges **28** that serves to connect the lid and chamber by insertion of a pin, Lid part **26** of depressed eyelet for locking by a padlock, air in-lets **24** protected by the overhanging lid, depressions **29** to accommodate nuts from mounting the beach-safety-box on a sun-bed, grooves **19** to accommodate mount, groove **20** to immobilise handle for changing gear in the high position (decoupled position),
 20 chamber part **25** of depressed eyelet for locking by a padlock, mount **31** to attach the beach-safety-box to a sun-bed and nuts and round-headed bolts **30** for attaching the mount on a sun-bed (bolts are inserted such that the mount cannot be dismounted when the beach-safety-box is attached).

- 25 Fig.7 shows front and side view of a possible design of a beach-safety-box with an integrated mechanical code lock. 3-wheel mechanical code-lock **32**, protective cover-lid **33** for code-lock, locking bolt **34**, insertion point **36** for code-lock activating pin, insertion hole **35** for locking bolt, air in-lets **24** protected by the overhanging lid, hinges **28** that serves to connect the lid and chamber by insertion of a pin, groove **19** to accommodate mount,
 30 horizontal grid **22** that allows water and sand to pass through and slit **23** that drains water and sand that has accidentally entered the beach-safety-box.

- Fig. 8. Side view of a possible design of a two-piece safety-screw comprising a threaded tip **37** a gear-box **38**, a rod **39** carrying a screw-slot or a similar functionality which allows
 35 insertion of a device that facilitates rotational movements of the screw and a hole that allows insertion of a locking element, a locking element **40** carrying a domain **41** that fits into the gear-box thereby enabling the transmission of rational movement from the rod to the treaded tip and a chamber **42** into which the tip of the locking element carrying the locking domain can be driven thereby decoupling rotational movements between the rod
 40 and treaded tip. Also shown is two the views of the safety screw with locking element **40** and either a screw slot or an Allen key slot **43**

Fig. 9. Side view of a possible design of a two-piece safety-screw carrying a lock-and key function that determines whether or not the screw can be unscrewed. Threaded tip **37** a

gear-box **38**, a rod **39** carrying a screw-slot or a similar functionality which allows insertion of a device that facilitates rotational movements of the screw, and a lock **44** that can be switched between positions that either couples or decouples the rotational movement of the treaded tip and rod.

5

Fig. 10. Side view of a possible design of a two-piece safety-screw that converts into a safety screw when a pre-determined torque is applied to the screw. Threaded tip **37** a gear-box **38**, a rod **39** carrying a screw-slot or a similar functionality which allows insertion of a device that facilitates rotational movements of the screw and a locking
10 element (which may be either a separate object or a protrusion at the end of the rod) **46** that locks the transmission of rational movement from the rod to the treaded tip and which breaks when a pre-determined torque is applied.

15

CLAIMS

1. A lock for a safety box, said lock comprising

- 5 – a lock effectuating means adapted to shift between a locked state and an unlocked state,
- a code-entering means arranged to control shifting of the lock effectuating means from the locked state to the unlocked state upon entering a code, and
- a lock actuation means adapted to actuate the code-entering means to accept and
- 10 store a user-defined code upon receipt of a lock actuator,

wherein the ability of the lock to shift between the locked and unlocked state is conditioned on the actuation of the lock.

- 15 2. A lock according to claim 1, wherein the code-entering means allows multiple entering of codes for systematically entering and testing all possible codes.

3. A lock according to claim 1 or 2, wherein the code-entering means is provided with a code sample space in the range of 50-1000.

20

4. A lock according to any of the preceding claims, that enables redefinition of the user-defined code by removal and re-insertion of the actuator.

- 5. A lock according to any of the preceding claims, wherein removal of the actuator shifts
- 25 the lock to its unlocked position.

6. An electrically powered lock according to any of the preceding claims, wherein the user-defined code is maintained when the power supply is exhausted and the lock is re-powered by a new power supply.

30

7. A lock according to any of the preceding claim, wherein the lock actuation means comprises a lock actuation template adapted to receive a lock actuator with a specific shape.

- 35 8. A lock according to any of the preceding claims, wherein the lock actuation means comprises a lock actuation template adapted to receive a lock actuator with a specific weight.

- 9. A lock according to any of the preceding claims, wherein the lock actuation mechanism
- 40 comprises an adjustable lock actuation template adapted to receive a multitude of different lock actuators.

10. A lock according to any of the preceding claims, wherein the lock is made of a non-corroding materials.

45

11. A lock according to claim 9, wherein the lock is made of a plastic.
12. A locking system comprising a plurality of locks according to any of claims 1-8 and 10-11.
- 5 13. A locking system according to claim 12, further comprising a plurality of lock actuation templates adapted to receive actuators of different shape.
- 10 14. A beach chair comprising a safety box with a closable cavity for storage of personal items.
- 15 15. A chair according to claim 14, wherein the safety box is provided with a locking means that prevents opening of the safety box.
16. A chair according to claims 14 or 15, wherein the safety box comprises a code-lock according to any of claims 1-13.
17. A chair according to claim 16, wherein the code-entering part of the code-lock is located on the side of the safety box.
- 20 18. A chair according to claim 16 or 17, wherein the code-entering part of the code-lock is protected by a coverlid that automatically falls down over the code-entering part of the code lock if not actively lifted.
- 25 19. A chair according to claims 14 or 15, wherein the safety box locking means is adapted to co-operate with a padlock.
20. A chair according to any of claims 1-19, wherein the safety box comprises
- 30 - a bottom and an opening,
- sidewalls extending between the bottom and the opening,
- a closure for closing the opening, and
- 35 - a locking means that prevents opening of the safety box.
21. A chair according to any of claims 14-20, wherein the safety box is provided with one or more ventilation openings for ventilation of the cavity.
- 40 22. A chair according to claim 21, wherein the ventilation opening(s) in the safety box is provided between the sidewall and the closure.

23. A chair according to claims 21-22, wherein the ventilation opening(s) in the safety box is shielded towards impact of weather (in particular towards impact of rain and sand).
24. A chair according to any of claims 14-23, wherein the safety box is provided with one
5 or more drain openings for draining the cavity.
25. A chair according to claim 24, wherein the safety box drain opening(s) is provided in a lower part of the sidewall(s) or in the bottom.
- 10 26. A chair according to any of claims 24-25, wherein the safety box is provided with a grid for retaining the personal items in the box in a position between the opening and the grid, isolated from the drain opening.
27. A chair according to any of claims 24-26, wherein the bottom of the safety box is
15 adapted to lead fluids to the drain opening(s).
28. A safety box similar to the box according to any of the claims 14-27, said box further comprising fastening means provided with a fastened and a non-fastened state for releasable fastening of the box to peripheral objects.
20
29. A box according to claim 28, wherein the fastening means is provided with a fastening and releasing control accessible only from the inside of the cavity.
30. A box according to claim 28 or 29, wherein the fastening means comprises a spring
25 activated locking element engaging a corresponding locking member of the beach chair or the safety anchor
31. A box according to any of claims 28-30, wherein the fastening means is adapted to allow fastening of the box to the beach chair in one orientation of the box in relation to the
30 beach chair or the safety anchor.
- 32 A chair comprising a mount for fastening a safety box similar to the box according to any of the claims 28-31.
- 35 33 A mount comprising means for fastening to a chair and a safety box similar to the box according to claims 28-31 and wherein the mount is fastened to the chair in such a way that the ability to detach it is hindered by subsequent mounting of the safety box.
34. A safety anchor to be secured by screwing, said anchor comprising at least a threaded
40 tip and a rod, the threaded tip and rod being interconnected in a joint allowing transmission of rotational movement from the rod to the threaded tip in one locked state and prevents transmission of rotational movement from the rod to the threaded tip in another unlocked state.

35. A safety anchor according to claim 34, being adapted to allow reversible shifting between the locked and the unlocked state.
36. A safety anchor according to any of the claims 34-35, wherein the joint is locked by the insertion of a locking element into a rotationally locking engagement in the rod and the threaded tip.
37. A safety anchor according to any of the claims 34-36, wherein the rod comprises a gripping means (extending in a direction opposite to the threaded tip) for applying a torque to the rod.
38. A safety anchor according to claim 36, where the locking element is accessible from the gripping means so as to allow shifting between the locked and the unlocked state from the gripping means.
39. A safety anchor according to any of the claims 36-38, wherein the joint is shifted from the locked to the unlocked state vice versa by the removal of the locking element from the joint.
40. A safety anchor according to claim 36, wherein the joint is shifted from the locking state to the unlocked state by irreversible breaking of the locking element.
41. A safety anchor according to claim 40, wherein the breakable element is adapted to break at a prespecified torque.
42. A safety anchor according to claim 40, wherein the joint is shifted from the locked to the unlocked state vice versa by displacement of the locking element in the axial direction of the anchor.
43. A safety anchor according to claim 42, wherein the locking element is displaced in a direction from the rod towards the threaded part.
44. A safety anchor according to claim 42, wherein the locking element is displaced in a direction from the threaded part towards the rod.
45. A safety anchor according to any of the claims 34-44, wherein the threaded part contains at least 5 threads.
46. A safety anchor according to any of the claims 34-45, wherein the length of the threaded part is at least 50% of the entire length of the safety anchor.
47. A safety anchor according to claim 36, wherein the rod is provided in the form of a hollow tube that houses the locking element.

48. A safety anchor according to claim 47, further comprising a handle member arranged to control the moving of the locking element from a top portion, opposite the threaded tip, of the rod.

5 49. A safety anchor according to any of claims 47-48, further comprising fixating means allowing fixation of the locking element in any of the first and/or the second positions.

50. A safety anchor according to any of claims 34-49, further comprising locking means adapted to receive a pad-lock for locking the locking element in either the locked and/or
10 the unlocked states of the anchor.

51. An anchor according to any of claims 34-50, wherein the rod comprises attachment means for securing peripheral objects to the anchor.

15 52. An anchor according to claim 51, wherein said object is selected from a group consisting of: a beach-safety box according to any of claims 28-31, a beach according to any of claims 14-21, a parasol, a bike, a motor cycle, a boat, an animal, a fishing rod, a gun, a sculpture, a lawnmower, a garden pot and a car.

20

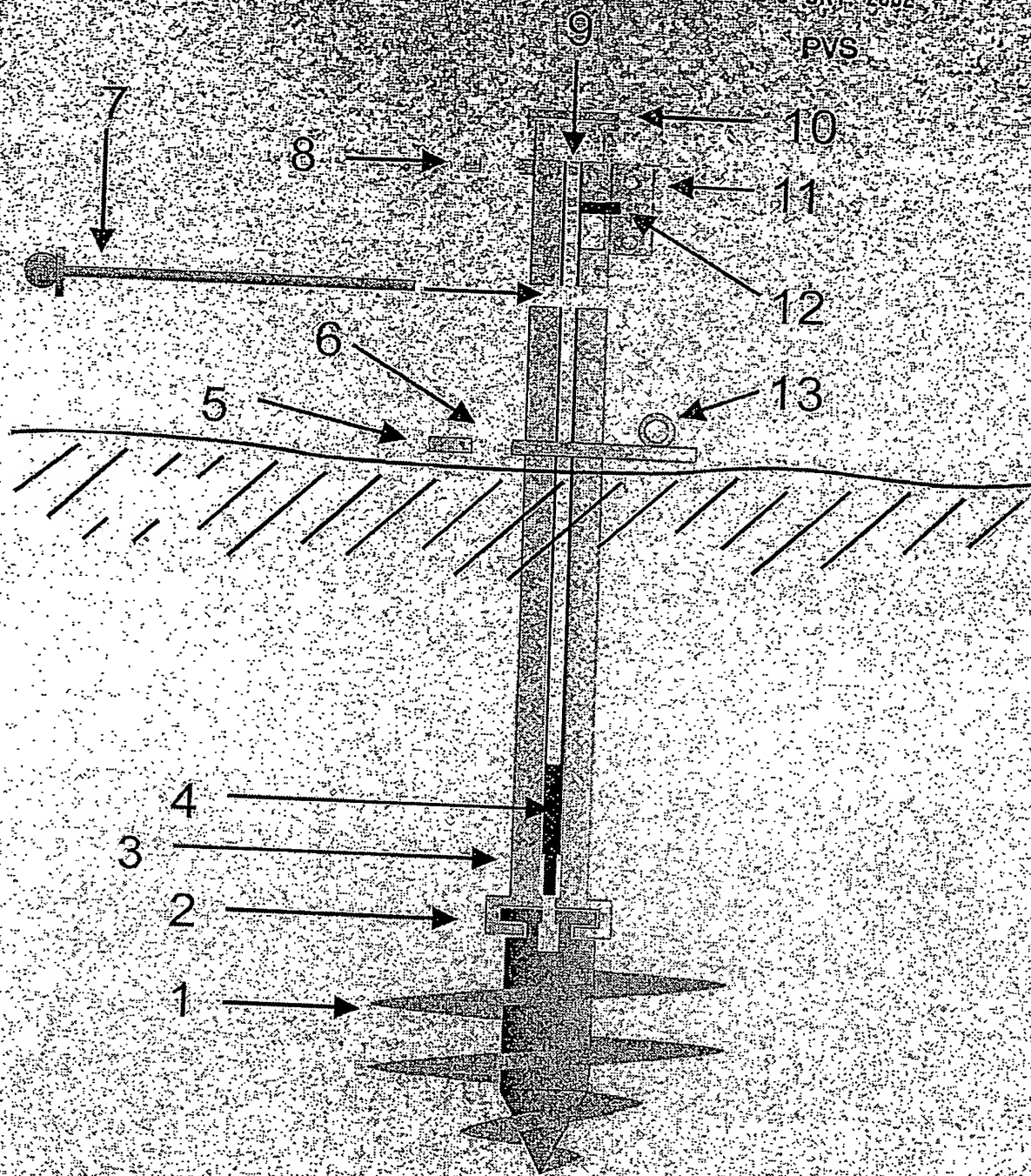


Fig. 1

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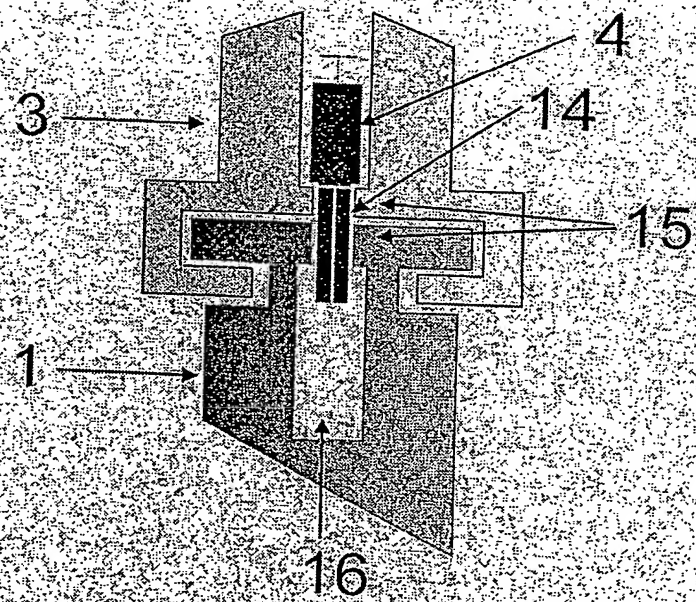
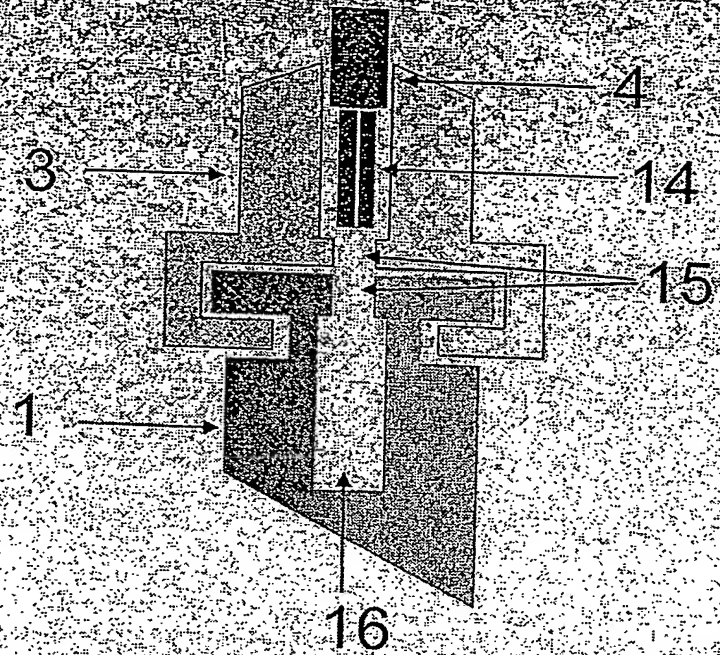


Fig. 2

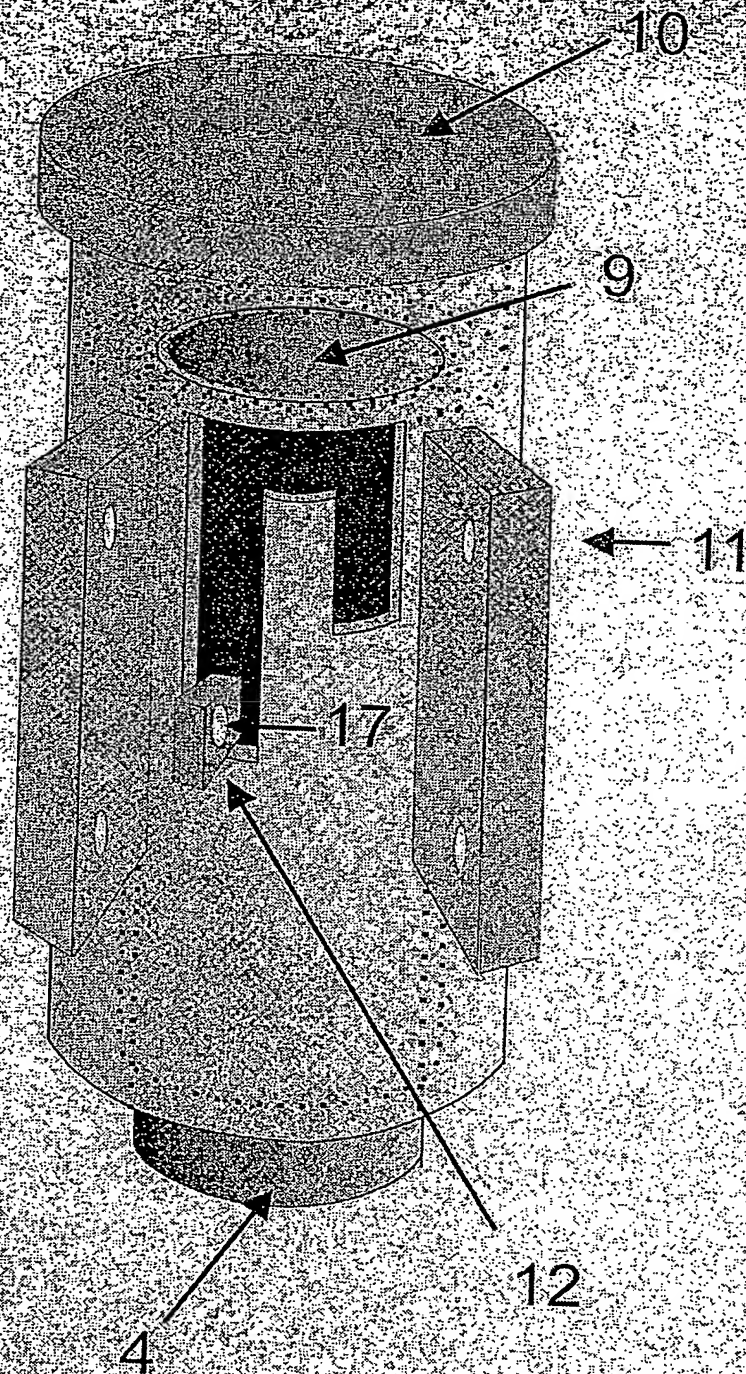


Fig. 3

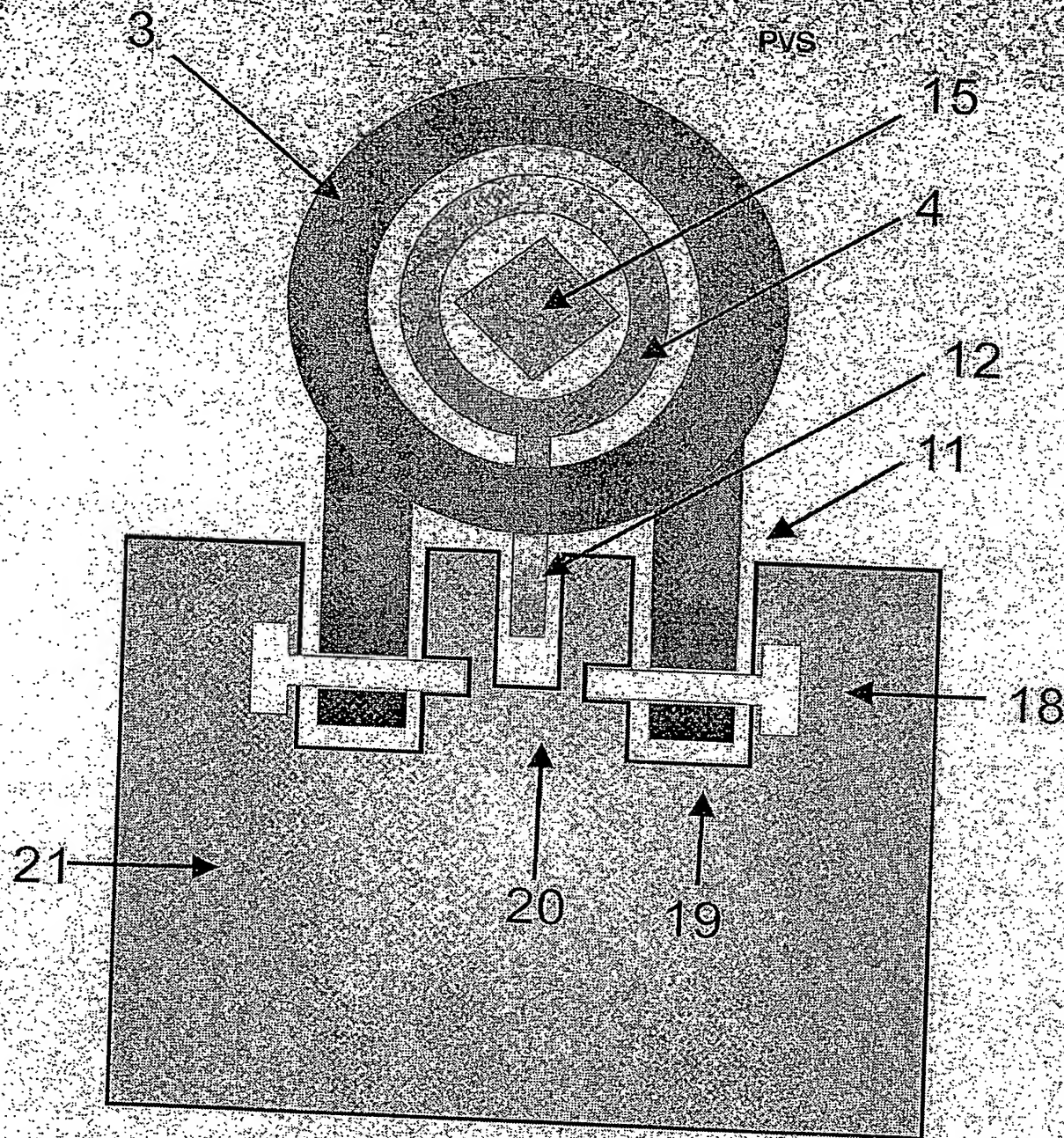


Fig. 4

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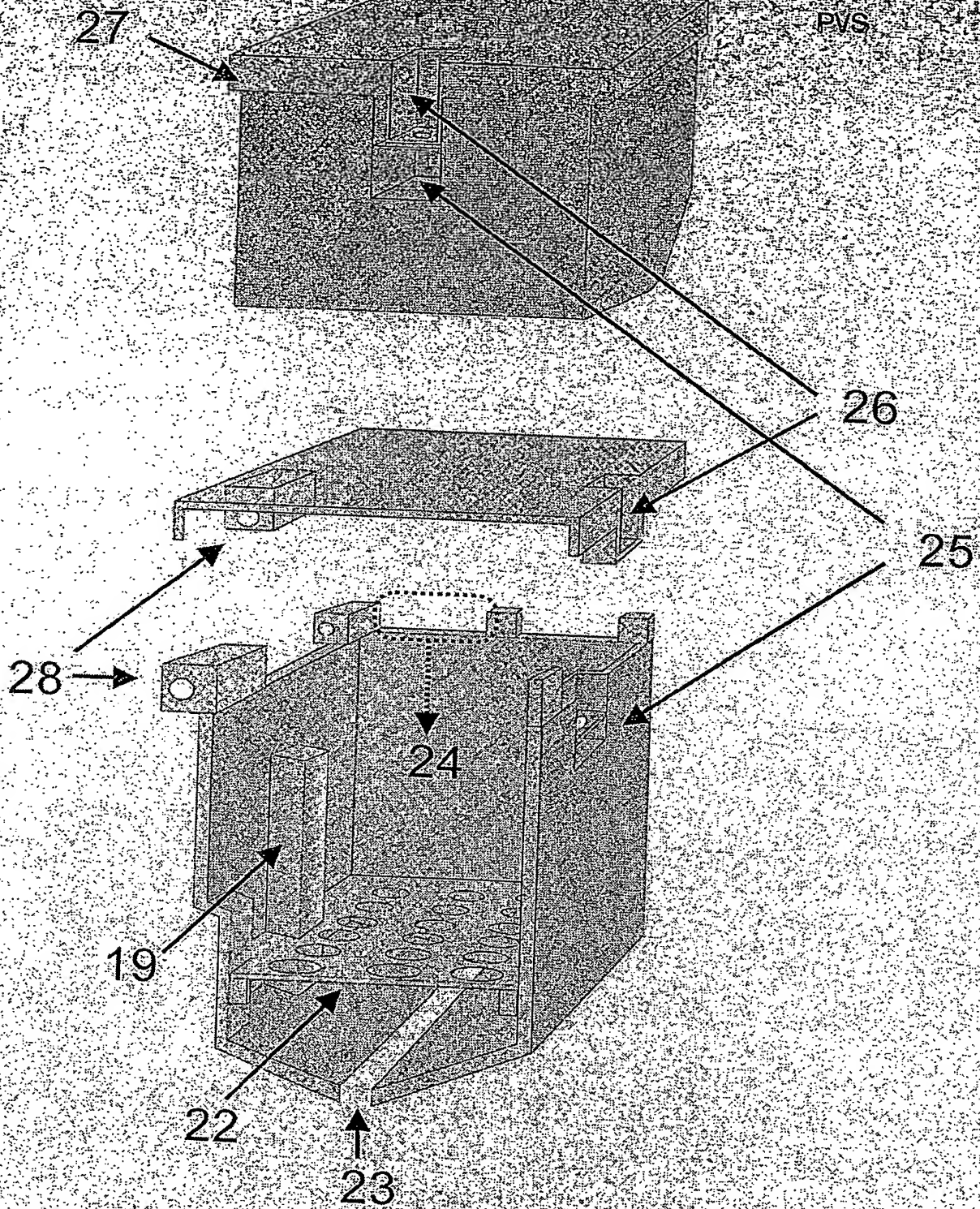


Fig. 5

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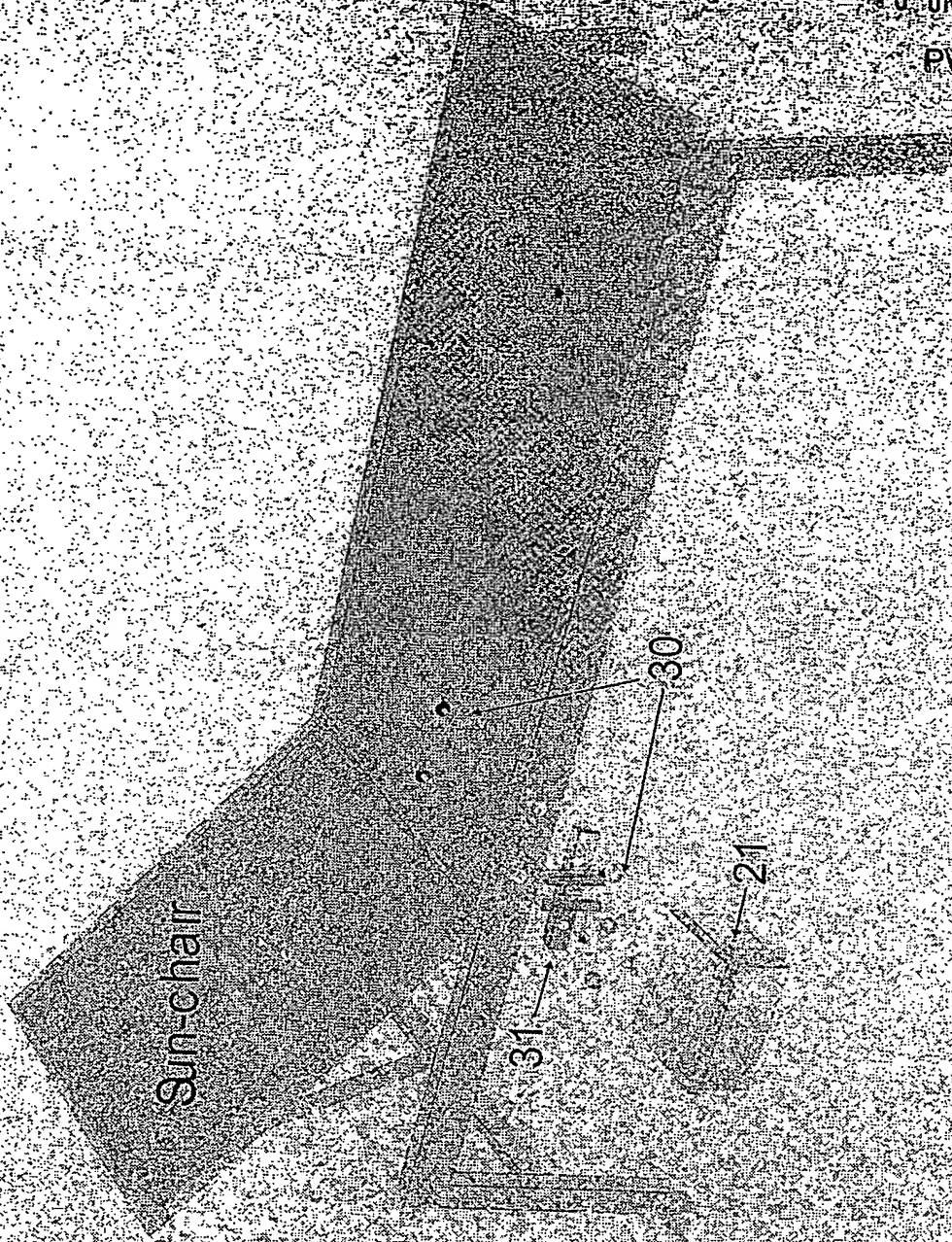


Fig. 6A

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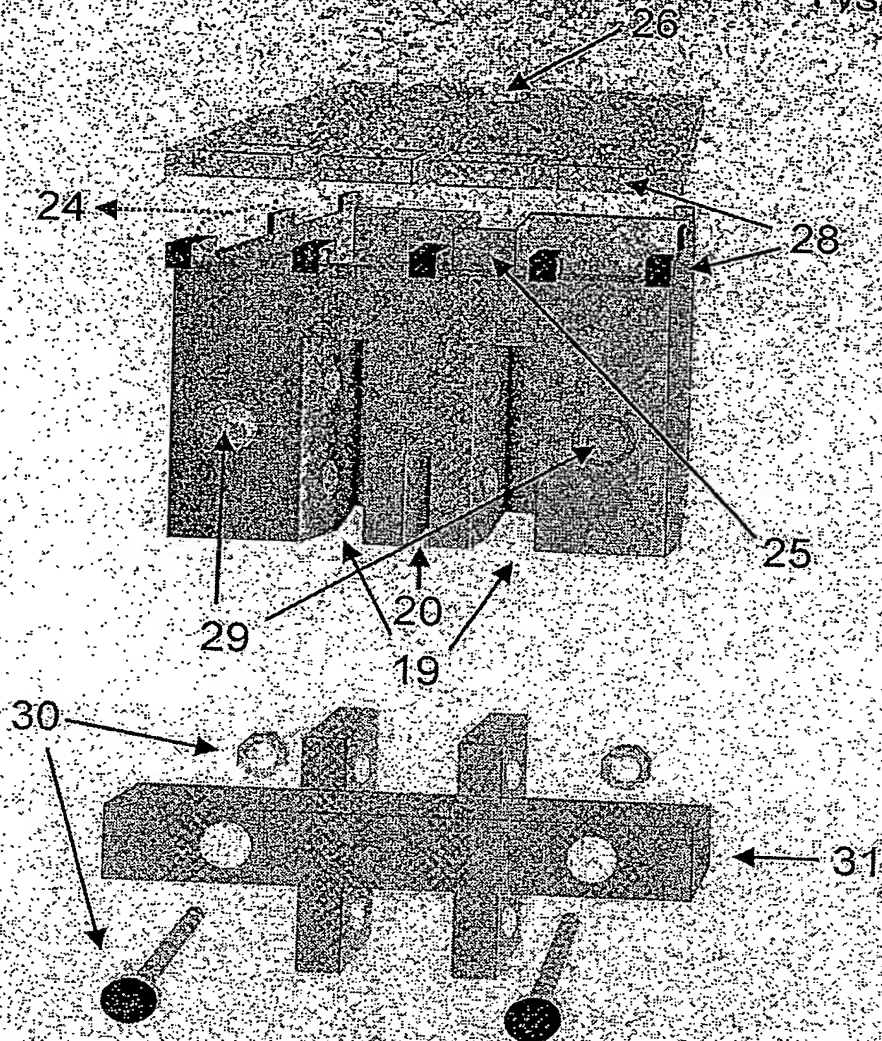


Fig. 6B

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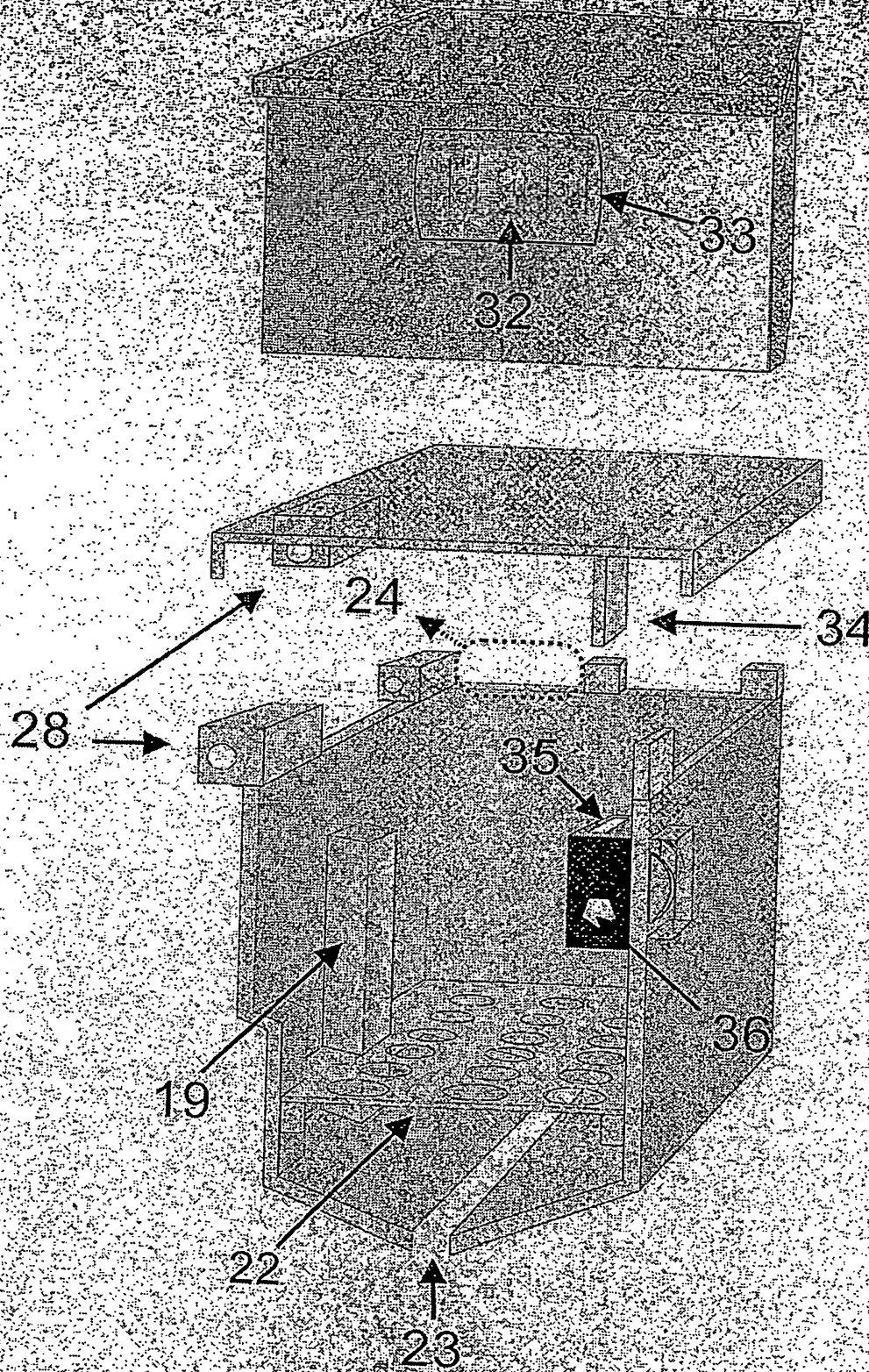


Fig. 7

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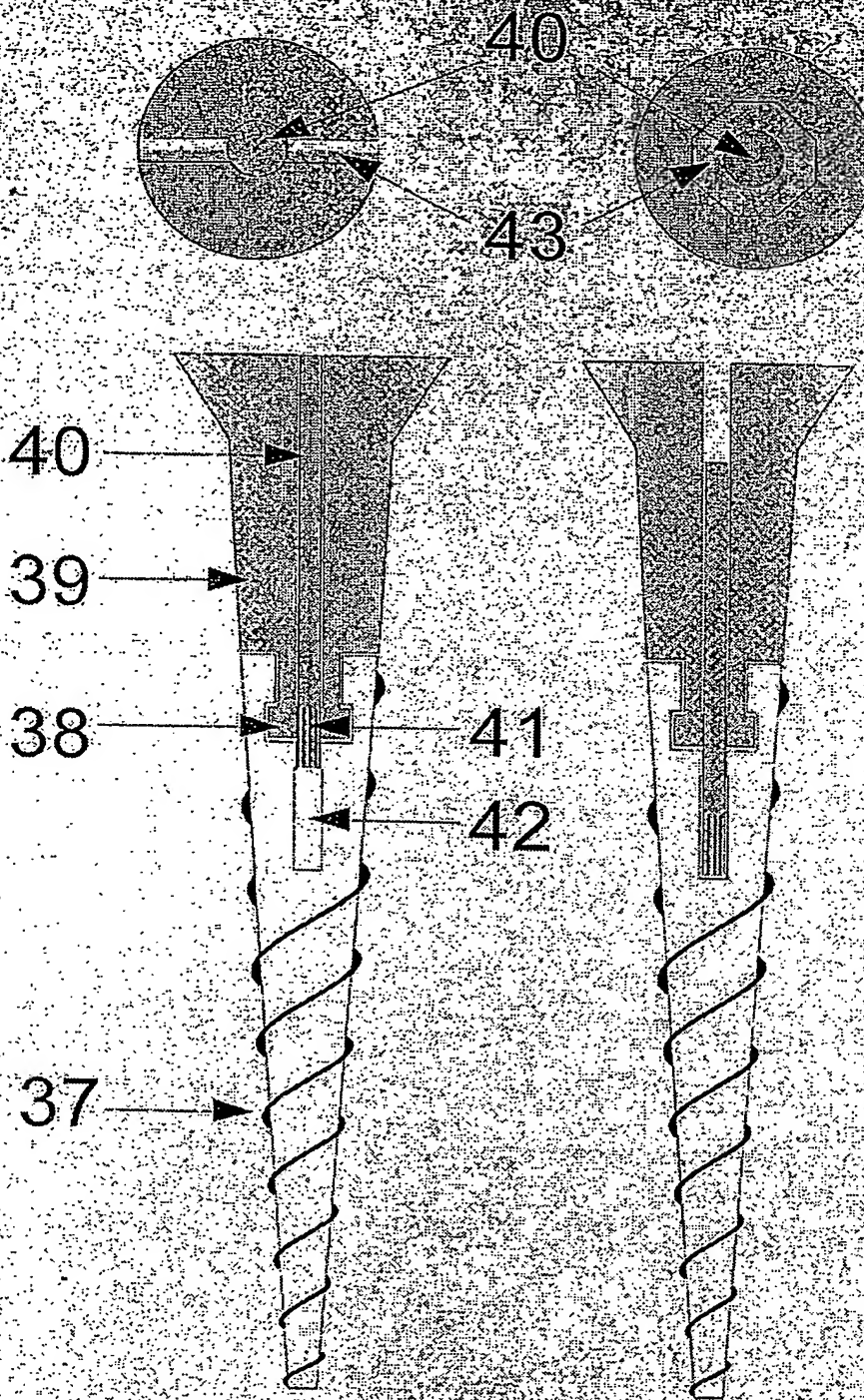


FIG 8

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Coupled

Decoupled

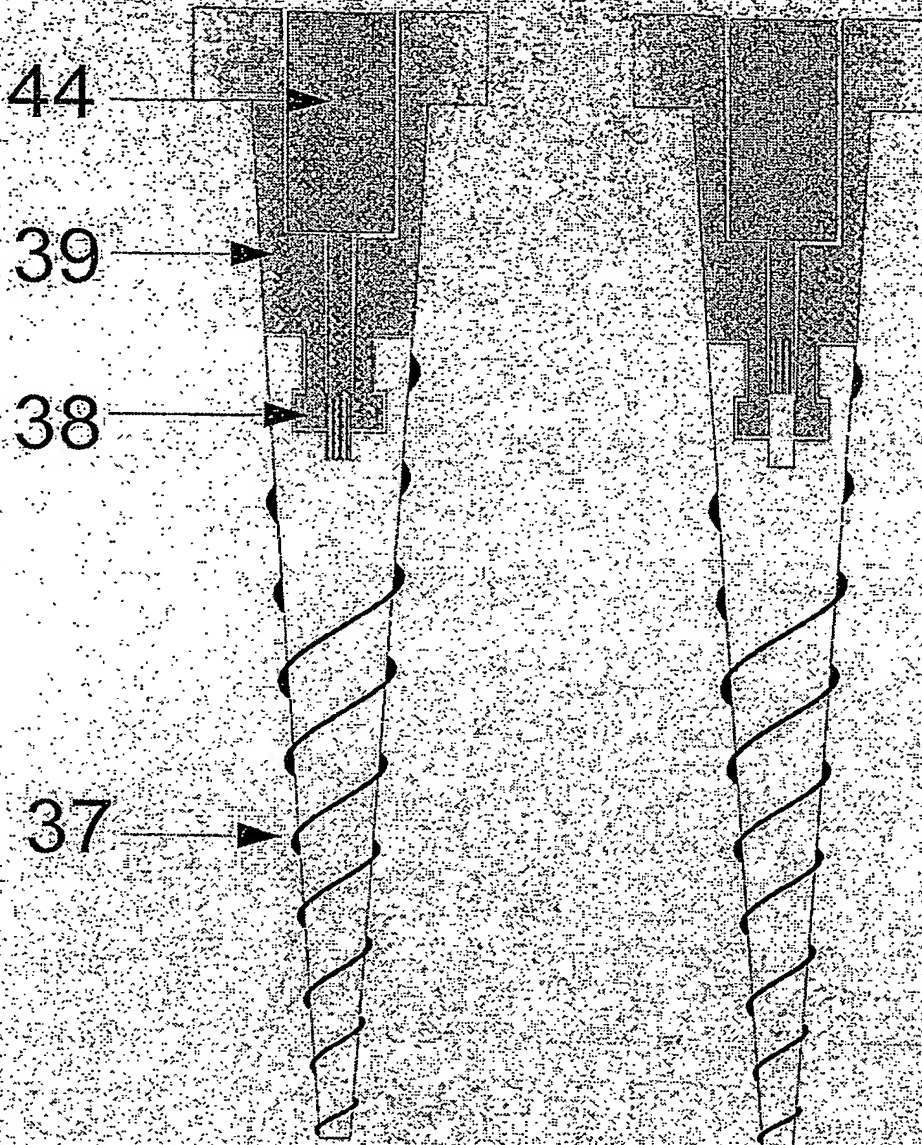


FIG 9

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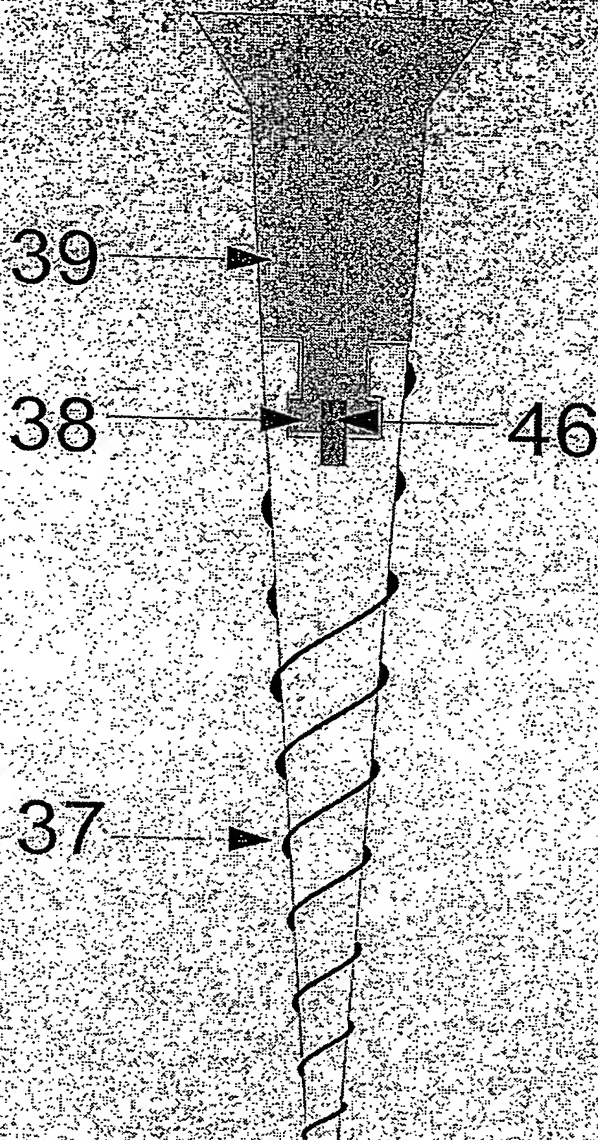


FIG 10

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